

# MUSCULAR SYSTEM - AN OVERVIEW

Skeletal muscles enable the body to move. Most are firmly anchored to the bone at one end, the *origin* of the muscle, while the other end is attached to the bone to be moved, and is known as the *insertion*. The fleshy central portion is termed the *belly*. The ends of a muscle are attached to bone most often by means of a narrow band of connective tissue called a *tendon*. They may also be joined directly to the *periosteum* of the bone. Finally, muscles may be united with each other or to a bone by means of a broad, flat sheet of tendonous tissue known as an *aponeurosis*.

As you dissect, locate the origins and insertions of the muscles studied. Then free the muscle from other muscles and from the nerves and blood vessels associated with it. The fine, transparent connective tissue which binds adjacent muscles is *deep fascia*, while tougher and more fibrous *superficial fascia* connects the skin to the muscles below. When the muscle has been freed, pull it gently. This will duplicate the muscle's normal contraction. Observe which bones or organs are moved, which are relatively stable.

## Actions of Muscles:

The *action* of a muscle results from its contraction. Muscles are generally arranged in *antagonistic* pairs. This means that when a muscle causes a structure to move in one direction, one or more antagonists cause it to move in the opposite direction. Some muscles assist others in their actions, thereby bringing about more efficient movement. These are known as *synergistic* muscles.

**Flexion** — to bend at a joint decreasing the angle at that joint; examples: elbow or knee joint

**Extension** — to straighten joint increasing the angle at that joint

**Adduction** — to move appendage toward sagittal midline; example: lowering arms from shoulder level, to rest at sides

**Abduction** — to move appendage away from sagittal midline; example: raising arms from rest at sides to shoulder level

**Supination** — to turn palm of hand upward

**Pronation** — to turn palm of hand downward

**Rotation** — to move a structure about a point; example: turning head from side to side

**Circumduction** — when the distal end of a limb describes a circle while the proximal end remains fixed, as the vertex of a cone; example: the movement of the extended arm in drawing a circle on the blackboard